

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES
MISSOURI CLEAN WATER COMMISSION



MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

Permit No.: MO-0000299
Owner: TPG Wafer Holdings, LLC.
Owner's Address: 301 Commerce St., Suite 330, Fort Worth, TX 76102
Operating Authority: Same as above
Operating Authority's Address: Same as above
Facility Name: MEMC, Inc. – St. Peters Plant
Facility Address: 501 Pearl Drive, St. Peters, MO 63376
Legal Description: E½, E½, SE¼, Sec. 22, T47N, R3E, St. Charles County
Receiving Stream: Wet Weather Branch of Belleau Creek (U)
First Classified Stream and ID: Belleau Creek (C) (00220)
USGS Basin & Sub-watershed No.: 07110009-030003

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

FACILITY DESCRIPTION

See next page

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

December 2, 2005

Effective Date

Doyle Childers, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

December 1, 2010

Expiration Date

Mohamad Alhalabi, P.E., Director, St. Louis Regional Office

FACILITY DESCRIPTION (continued)

Outfall #001 – Industry (Manufacturer of silicon wafers for the electronics industry)
– SIC #3674

Two cell lagoon/sludge is retained in lagoon/storm water runoff/cooling water/reverse osmosis water/treated ground water.
Actual flow is 410,000 gallons per day.

Outfall #002 – Industry (Manufacturer of silicon wafers for the electronics industry)
– SIC #3674

Storm water runoff/Outfall #001 overflow.
Flow is dependent upon precipitation.

Outfall #003 – Industry (Manufacturer of silicon wafers for the electronics industry)
– SIC #3674

Storm water runoff/Outfall #001 overflow.
Actual flow dependent on precipitation.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 3 of 10	
					PERMIT NUMBER MO-0000299	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
<u>Outfall #001</u>						
Flow	MGD	*		*	once/weekday** 24 hr. total	
Biochemical Oxygen Demand ₅	mg/L lbs./day	45 154		30 102	once/month	grab
Total Suspended Solids	mg/L lbs./day	80 273		60 205	once/month	grab
pH – Units	SU	***		***	once/month	grab
Total Arsenic	mg/L	*		*	once/month	grab
Total Chromium	mg/L lbs./day	0.20 0.68		0.10 0.34	once/month	grab
Total Copper	mg/L	*		*	once/month	grab
Total Nickel	mg/L	*		*	once/month	grab
Total Silver	mg/L	*		*	once/month	grab
Total Zinc	mg/L	*		*	once/month	grab
Total Fluoride	mg/L lbs./day	15 51		10 34	once/month	grab
Trichloroethylene	mg/L lbs./day	.59 2			once/month	grab
Oil and Grease	mg/L lbs./day	15 51		10 34	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>MONTHLY</u> ; THE FIRST REPORT IS DUE <u>January 28, 2006.</u>						
<u>Outfall #001</u>						
Total Toxic Organics (Note 1)	mg/L	1.37		1.37	once/quarter****	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>April 28, 2006</u>						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Parts I</u> STANDARD CONDITIONS DATED <u>October 1, 1980</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS					PAGE NUMBER 4 of 10	
					PERMIT NUMBER MO-0000299	
The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:						
OUTFALL NUMBER AND EFFLUENT PARAMETER(S)	UNITS	FINAL EFFLUENT LIMITATIONS			MONITORING REQUIREMENTS	
		DAILY MAXIMUM	WEEKLY AVERAGE	MONTHLY AVERAGE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Outfall #001 (continued) Whole Effluent Toxicity (WET) Test	% Survival	(See Special Condition #2)			once/year	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>ANNUALLY</u> ; THE FIRST REPORT IS DUE <u>October 28, 2006</u> .						
<u>Outfall #002</u>						
Flow	MGD	*		*	once/month	24 hr. total
Settleable Solids	ml/L	1.5		1.0	once/month	grab
Temperature	°F	*		*	once/month	grab
Oil and Grease	mg/L	15		10	once/month	grab
pH – Units	SU	*****		*****	once/month	grab
<u>Outfall #003</u>						
Flow	MGD	*		*	once/month	24 hr. total
Settleable Solids	ml/L	1.5		1.0	once/month	grab
Temperature	°F	*		*	once/month	grab
Oil and Grease	mg/L	15		10	once/month	grab
pH – Units	SU	*****		*****	once/month	grab
MONITORING REPORTS SHALL BE SUBMITTED <u>QUARTERLY</u> ; THE FIRST REPORT IS DUE <u>April 28, 2006</u> .						
B. STANDARD CONDITIONS						
IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED <u>Part I</u> STANDARD CONDITIONS DATED <u>October 1, 1980 and August 15, 1994</u> , AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.						

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.

** Once each weekday means: Monday, Tuesday, Wednesday, Thursday, and Friday.

*** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.0-9.0 pH units.

**** Once per quarter in the months of March, June, September, and December.

***** pH is measured in pH units and is not to be averaged. The pH shall be maintained in the range of 6.0-9.0 units.

Note 1 – The discharge monitoring report shall include data on each individual pollutant as well as the calculated Total Toxic Organics.

1,2,4 Trichlorobenzene
chloroform
1,2 Dichlorobenzene
1,3 Dichlorobenzene
1,4 Dichlorobenzene
ethylbenzene
1,1,1, Trichloroethane
methylene chloride
naphthalene
2 Nitrophenol
phenol
bis (20 ethylhexyl) phthalate
tetrachloroethylene
toluene
trichloroethylene
toluene
trichloroethylene
2 Chlorophenol
2,4 Dichlorophenol
4 Nitrophenol
pentachlorophenol
di-n-butyl phthalate
anthracene
1,2 Diphenylhydrazine
isophorone
butyl benzyl phthalate
2,4,6 Trichlorophenol
carbon tetrachloride
1,2 Dichloroethane
1,1,2 Trichloroethane
dichlorobromomethane.

C. SPECIAL CONDITIONS

1. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

- (a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
 - (1) One hundred micrograms per liter (100 ug/L);
 - (2) Two hundred micrograms per liter (200 ug/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
 - (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
 - (4) The level established in Part A of the permit by the Director.
- (b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

C. SPECIAL CONDITIONS(cont.)

2. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

SUMMARY OF WET TESTING FOR THIS PERMIT				
OUTFALL	A.E.C. %	FREQUENCY	SAMPLE TYPE	MONTH
001	100	Once/year	grab	September

(a) Test Schedule and Follow-Up Requirements

- (1) Perform a SINGLE-dilution test in the months and at the frequency specified above. For tests which are successfully passed, submit test results USING THE DEPARTMENT'S WET TEST REPORT FORM #MO-780-1899 along with complete copies of the test reports as received from the laboratory, including copies of chain-of-custody forms within 30 calendar days of availability to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102. If the effluent passes the test, do not repeat the test until the next test period.
 - (a) For discharges of stormwater, samples shall be collected within three hours from when discharge first occurs.
 - (b) Samples submitted for analysis of stormwater discharges shall be collected as a grab.
 - (c) For discharges of non-stormwater, samples shall be collected only when precipitation has not occurred for a period of forty-eight hours prior to sample collection. In no event shall sample collection occur simultaneously with the occurrence of precipitation.
 - (d) A twenty-four hour composite sample shall be submitted for analysis of non-stormwater discharges.
 - (e) Upstream receiving water samples, where required, shall be collected upstream from any influence of the effluent where downstream flow is clearly evident.
 - (f) Samples submitted for analysis of upstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (g) Chemical and physical analysis of the upstream control and effluent sample shall occur immediately upon being received by the laboratory, prior to any manipulation of the effluent sample beyond preservation methods consistent with federal guidelines for WET testing that are required to stabilize the sample during shipping.
 - (h) Any and all chemical or physical analysis of the effluent sample performed in conjunction with the WET test shall be performed at the 100% Effluent concentration in addition to analyses performed upon any other effluent concentration.
 - (i) All chemical analyses included in the Missouri Department of Natural Resources WET test report form #MO-780-1899 shall be performed and results shall be recorded in the appropriate field of the report form.
 - (j) Where flow-weighted composite sample is required for analysis, the samples shall be composited at the laboratory where the test is to be performed.
 - (k) Where in stream testing is required downstream from the discharge, sample collection shall occur immediately below the established Zone of Initial Dilution in conjunction with or immediately following a release or discharge.
 - (l) Samples submitted for analysis of downstream receiving water may be collected as either a grab or twenty-four-hour composite as appropriate to the nature of the discharge.
 - (m) All instream samples, including downstream samples, shall be tested for toxicity at the 100% concentration in addition to any other assigned AEC for in-stream samples.
- (2) All failing test results along with complete copies of the test reports as received from the laboratory, INCLUDING THOSE TESTS CONDUCTED UNDER CONDITION (3) BELOW, shall be reported to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the availability of the results.

C. SPECIAL CONDITIONS 2. Whole Effluent Toxicity (WET) tests (cont.)

- (3) If the effluent fails the test, a multiple dilution test shall be performed within 30 calendar days and biweekly thereafter, until one of the following conditions are met:
 - (a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
 - (b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.
 - (4) Failure of at least three multiple-dilution tests during any period of accelerated monitoring violates the permit narrative requirement for aquatic life protection.
 - (5) The permittee shall submit a CONCISE summary of all test results for the test series to the WATER PROTECTION PROGRAM, P.O. Box 176, Jefferson City, MO 65102 within 14 calendar days of the third failed test.
 - (6) Additionally, the following shall apply upon failure of the third MULTIPLE DILUTION test: A toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE) is automatically triggered. The permittee shall contact THE WATER PROTECTION PROGRAM within 14 calendar days from availability of the test results to ascertain as to whether a TIE or TRE is appropriate. The permittee shall submit a plan for conducting a TIE or TRE to the WATER PROTECTION PROGRAM within 60 calendar days of the date of DNR's direction to perform either a TIE or TRE. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.
 - (7) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.
 - (8) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.
 - (9) When WET test sampling is required to run over one DMR period, each DMR report shall contain a copy of the Department's WET test report form that was generated during the reporting period.
 - (10) Submit a concise summary in tabular format of all test results with the annual report.
- (b) PASS/FAIL procedure and effluent limitations:
- (1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other Federal guidelines as appropriate or required.

C. SPECIAL CONDITIONS

2. Whole Effluent Toxicity (WET) tests

(b) PASS/Fail procedure and effluent limitations (cont.)

(2) To pass a multiple-dilution test:

- (A) For facilities with a computed percent effluent at the edge of the zone of initial dilution, Allowable Effluent Concentration (AEC), OF 30% OR LESS THE AEC must be less than three-tenths (0.3) of the LC₅₀ concentration for the most sensitive of the test organisms; **OR**,
- (B) For facilities with an AEC greater than 30% the LC₅₀ concentration must be greater than 100%; **AND**,
- (C) all effluent concentrations equal to or less than the AEC must be nontoxic. Mortality observed in all effluent concentrations equal to or less than the AEC shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the upstream receiving-water control sample. Where upstream receiving water is not available mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; $p = 0.05$) than that observed in the laboratory control. The appropriate statistical tests of significance shall be consistent with the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS or other federal guidelines as appropriate or required. Failure of one multiple-dilution test may be considered an effluent limit violation.

(c) Test Conditions

(1) Test Type: Acute Static non-renewal

- (2) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing shall come from cultures reared for the purpose of conducting toxicity tests and cultured in a manner consistent with the most current USEPA guidelines. All test animals shall be cultured as described in the most current edition of METHODS FOR MEASURING THE ACUTE TOXICITY OF EFFLUENTS AND RECEIVING WATERS TO FRESHWATER AND MARINE ORGANISMS.

- (3) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.

- (4) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.

(5) Single-dilution tests will be run with:

- (a) Effluent at the AEC concentration;
- (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
- (c) reconstituted water.

(6) Multiple-dilution tests will be run with:

- (a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
- (b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
- (c) reconstituted water.

- (7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

- (8) If upstream control mortality exceeds 10%, the entire test will be rerun using reconstituted water as the dilutant.

SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless more stringent methods are specified by the DNR, the procedures shall be consistent with the most current edition of Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms.

Test conditions for Ceriodaphnia dubia:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light, 8 h dark
Size of test vessel:	30 mL (minimum)
Volume of test solution:	15 mL (minimum)
Age of test organisms:	<24 h old
No. of animals/test vessel:	5
No. of replicates/concentration:	4
No. of organisms/concentration:	20 (minimum)
Feeding regime:	None (feed prior to test)
Aeration:	None
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test acceptability criterion:	90% or greater survival in controls

Test conditions for Pimephales promelas:

Test duration:	48 h
Temperature:	25 ± 1°C Temperatures shall not deviate by more than 3°C during the test.
Light Quality:	Ambient laboratory illumination
Photoperiod:	16 h light/ 8 h dark
Size of test vessel:	250 mL (minimum)
Volume of test solution:	200 mL (minimum)
Age of test organisms:	1-14 days (all same age)
No. of animals/test vessel:	10
No. of replicates/concentration:	4 (minimum) single dilution method 2 (minimum) multiple dilution method
No. of organisms/concentration:	40 (minimum) single dilution method 20 (minimum) multiple dilution method
Feeding regime:	None (feed prior to test)
Aeration:	None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min.
Dilution water:	Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness.
Endpoint:	Pass/Fail (Statistically significant Mortality when compared to upstream receiving water control or synthetic control if upstream water was not available at $p \leq 0.05$)
Test Acceptability criterion:	90% or greater survival in controls

C. SPECIAL CONDITIONS (cont.)

3. Industrial Sludge Disposal

(a) Disposal of industrial sludge is not authorized by this permit. Industrial sludge shall be disposed at a permitted solid waste disposal facility in accordance with 10 CSR 80; or if the sludge is determined to be hazardous waste, shall be disposed at a permitted hazardous waste disposal facility pursuant to 10 CSR 25.

(b) Non-hazardous sludge that is disposed on site or that is exempted under 10 CSR 80 must obtain applicable permits under 10 CSR 20-6.015 and 10 CSR 20-6.200.

(c) Each effluent monitoring report shall also specify the date any sludge is removed from the facility, who removed the sludge and the number of gallons or quantity of sludge removed. The final disposal location shall be reported, including the name of the disposal facility, the solid waste or hazardous waste disposal permit number, and date of permit issuance.

(d) This permit may (after due process) be modified, or alternatively revoked and reissued, to comply with any applicable sludge disposal standard or limitation issued or approved under Section 405(d) of the Clean Water Act.

4. All outfalls must be clearly marked in the field.

5. This permit may be reopened and modified or alternatively revoked and reissued, to incorporate new or modified effluent limitations or other conditions, if the result of a wasteload allocation study, toxicity test, or other information indicates changes are necessary to ensure compliance with Missouri's Water Quality Standards.

6. This permit may be modified, or alternatively revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2) (C), and (D), 304(b)(2) and 307(a)(2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:

(a) Contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

(b) Controls any pollutant not limited in the permit.

The permit as modified or reissued under this paragraph shall also contain any other requirements of the Act then applicable.

7. General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

(a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;

(b) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;

(c) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;

(d) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;

(e) There shall be no significant human health hazard from incidental contact with the water;

(f) There shall be no acute toxicity to livestock or wildlife watering;

(g) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;

(h) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

8. Permittee is to abandon the treatment facilities described herein and shall connect the tributary waste load to trunk sewers within 90 days of notice of availability if trunk sewers operated by one of the authorities outlined in Section (3)(B)1 or 2 of Clean Water Commission Regulation 10 CSR 20-6.010 are made available to the site during the time a valid discharge permit exists.